

AN ANALYSIS OF THE DIMENSIONS OF THE ROMANIAN CIRCULAR ECONOMY IN THE EUROPEAN UNION CONTEXT

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ABSTRACT: *In the current context, marked by a profound insufficiency of resources with regards to the needs of mankind, the application of principles and efficient models of the circular economy needs to become a constant and sustained concern of every member state of the European Union. Therefore, Romania, a full member of the European Union, needs to align its circular economy objectives with the ones of the Union, transitioning from the linear economy to an economic model which can offer opportunities meant to reduce the pressure put upon the environment, and to confer a growth in competitiveness, innovation, and new jobs. An analysis of the dimensions of the circular economy in Romania, through some specific indicators used at the level of the EU, permits the outlining of a picture associated with the place occupied by our country in relation with the European average or other member states, and the measurement of the completion of desiderata assumed through the national or European plans or strategies regarding the circular economy.*

KEY WORDS: *durable development, circular economy, monitoring framework, economic indicators, member states, European Union.*

JEL CLASSIFICATIONS: *E66, O44, O52.*

1. INTRODUCTION

Currently, globally but especially within the European Union, it is spoken regarding the transition to a circular economy. Romania, as a member state of the European Union, has over the previous three decades gone through another transition,

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namely the transition to a market economy. This process has been gruelling but joining the European Union in 2007 has had a stimulating and accelerating effect upon it.

Even though important steps have been taken, we have to admit that there is still an important economic development gap between Romania and the other European economies. This is the reason why it is important for Romania to take measures and transpose in its strategies, plans, and especially laws European directives and regulations for a circular economy. The European Commission outlines the need for member states to align themselves towards a circular economy according to the 4R “reduce-reuse-recycle-redesign” model based on the product lifecycle, reuse of resources as much as possible and bringing down residual waste to near zero. This can be facilitated by developing and providing access to innovative financial instruments and funding for eco-innovation (EC, 2016).

The present paper wishes to make a succinct analysis of the level of durable development of Romania regarding the circular economy, compared with the other EU member states, on the basis of a set of indicators considered to be relevant, available in the Eurostat database.

2. THE NECESSITY OF MONITORING AT THE EU LEVEL OF THE TRANSITION TOWARDS A CIRCULAR ECONOMY

The transition towards a circular economy is not limited to certain materials or sectors. It is a systemic change which influences the entire economy, as well as all products and services.

In order to determine the level of the circular economy, across its different areas of interest, a variety of indicators are used, although most have limitations. The OECD and the G8 generally use resource productivity, measured as gross domestic product (GDP) divided by domestic material consumption, as an indicator for resource use. Other indicators measuring progress towards a circular economy include the EU resource efficiency scoreboard, the EU eco-innovation index, recycling rates, the amount of municipal waste per capita, or the amount of waste per GDP output.

Ideally, indicators should capture first and foremost the registered tendencies with regards to keeping the economic value of products, materials and resources, as well as regarding waste.

There is no universal indicator known as “circularity” and there are few solid indicators already elaborated which can describe the most relevant tendencies. With a single measure or score it would not be possible to adequately capture the complexity and numerous dimensions of the transition towards a circular economy. For this reason, the European Commission has established that for monitoring the member states a set of relevant indicators will be used, which can, in the future, be modified, adjusted, improved etc.

The monitoring framework within the EU has the goal to measure the progress towards a circular economy in a manner which includes its various dimensions in all the steps of the lifecycle of resources, products, and services. This is the reason why the monitoring framework has a set of ten indices grouped in four stages and aspects of

the circular economy and which largely follow the logic and structure of the EC's action plan (EC, 2018, pp. 2-3).

3. THE CURRENT PICTURE OF THE SIZE OF THE CIRCULAR ECONOMY AT THE LEVEL OF ROMANIA

In order to quantify the size of the circular economy in Romania compared to the other member states and the EU average, we have selected four indicators from amongst the ten previously mentioned, one for each of the stages and aspects of the circular economy included in the monitoring. They are: generation of waste excluding major mineral wastes per domestic material consumption; recycling rate of municipal waste; circular material use rate; gross investment in tangible goods.

The analysis stopped due to the availability of data on Eurostat for all four indicators at the beginning of 2018.

- The *Generation of waste excluding major mineral wastes per domestic material consumption* indicator shows the waste generated in a country, excluding major mineral wastes, divided by the domestic material consumption. The ratio is presented in percentages (%) because both terms are measured with the same unit, namely tons. It is very important to mention that, the smaller the value of the ratio, the better the performance of the given country is.

Table 1. Generation of waste excluding major mineral wastes per domestic material consumption at the level of EU member states in 2018

GEO	Indicator (%)	GEO	Indicator (%)	GEO	Indicator (%)
Belgium	26.4	France	13.3	Netherlands	27.9
Bulgaria	15.2	Croatia	8.8	Austria	9.9
Czechia	9.7	Italy	22.9	Poland	10.9
Denmark	7.4	Cyprus	5.2	Portugal	8.1
Germany	13.0	Latvia	4.8	Romania (s)	4.8
Estonia	29.7	Lithuania	7.9	Slovenia	10.3
Ireland	6.6	Luxembourg	10.0	Slovakia	11.7
Greece	13.3	Hungary	7.0	Finland	7.4
Spain	16.4	Malta	8.4	Sweden	8.7
United Kingdom	21.9	<i>EU – 28 countries (s)</i>	<i>13.6</i>		

(s) – Eurostat estimate

Source: https://ec.europa.eu/eurostat/databrowser/view/CEI_PC033/default/table?lang=en&category=cei.cei_pc

As can be observed from the values included in Table 1., and from the graph from Figure 1., Romania, compared with all of the other member states has the best position, even though the indicator has been estimated by Eurostat. The indicator's value is 8.8 percentages lower than the European average and around 6 times smaller than the values registered in Estonia, namely 29.7%, and the Netherlands, namely 27.9. All that said, taking into account the two indicators on which the synthetic indicator

has been calculated in Eurostat, and also the Eurostat data regarding waste generation at the level of Romania in 2018 which situates it amongst the nations with smaller quantities of generated waste, we can determine that the domestic material consumption is also low, sadly showcasing a low level of input in the production activity.

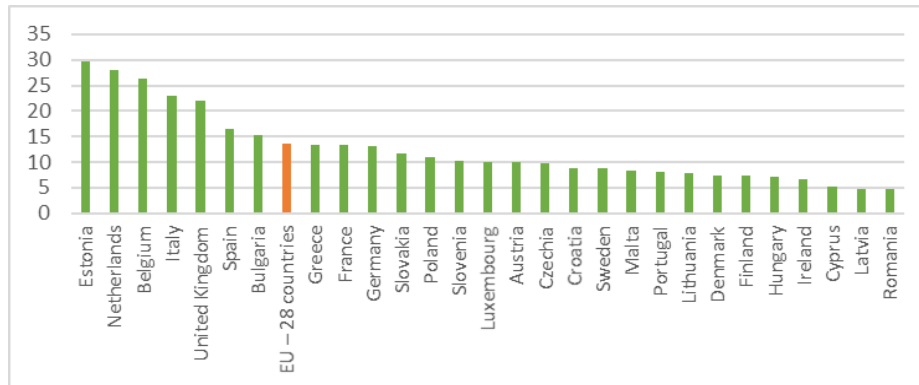


Figure 1. Generation of waste excluding major mineral wastes per domestic material consumption at the level of EU member states in 2018

- The *Recycling rate of municipal waste* indicator measures the percentage of recycled municipal waste from the total municipal waste generated. Recycling includes material recycling, composting, and anaerobic digestion. The ratio is presented in percentages (%) because both terms are measured with the same unit, namely tons.

This indicator presents a suggestion regarding the way final consumer waste is used as a resource in the circular economy, while a higher value of this rate shows the performance of the given country regarding recycling.

Table 2. Recycling rate of municipal waste at the level of EU member states in 2018

GEO	Indicator (%)	GEO	Indicator (%)	GEO	Indicator (%)
Belgium	54.4	France	45.1 (ep)	Netherlands	55.9
Bulgaria	31.5	Croatia	25.3	Austria	57.7
Czechia	32.3	Italy	49.8	Poland	34.3 (e)
Denmark	49.9	Cyprus	16.5	Portugal	29.1
Germany	67.1	Latvia	25.2	Romania	11.1
Estonia	28.0	Lithuania	52.5	Slovenia	58.9 (e)
Ireland	37.6	Luxembourg	49.0	Slovakia	36.3
Greece	20.1	Hungary	37.4	Finland	42.3
Spain	34.8	Malta	10.4	Sweden	45.8
United Kingdom	44.1	EU – 28 countries	46.8		

(ep) – estimated, provisional; (e) - estimated

Source: https://ec.europa.eu/eurostat/databrowser/view/CEI_WM011/default/table?lang=en&category=cei.cei_wm

Unfortunately for Romania, in the case of this indicator, unlike the first, the situation does not merit approval. From the data included in Table 2., and also from the graph in Figure 2., it can be seen that it is situated on the penultimate spot, just before Malta (with a difference of only 0.6%) in the ranking of members states.

Germany has a recycling rate of 67.1%, six times that of Romania, and in regards to the European average it is 4 times larger. Taking into account the fact that, out of these 28 member states, 9 are above the average, while 4 are nearing it, we can say that Romania has a gap which will be very difficult to diminish in the following years.

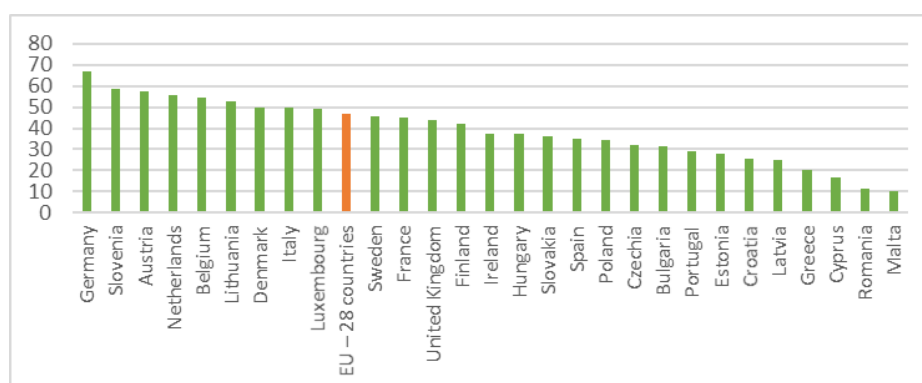


Figure 2. Recycling rate of municipal waste at the level of EU member states in 2018

- The *Circular material use rate* indicator measures the percentage of material recycled and reintroduced into the economy – therefore reducing primary raw material extraction – from the total use of materials. The use of circular material, also known as circular material use rate, is defined as the ratio between circular material use and total material use.

Table 3. Circular material use rate at the level of EU member states in 2018

GEO	Indicator (%)	GEO	Indicator (%)	GEO	Indicator (%)
Belgium	19.9	France	19.7	Netherlands	28.9
Bulgaria	2.5	Croatia	5.0	Austria	11.1 (p)
Czechia	10.5	Italy	18.8	Poland	9.8
Denmark	8.1	Cyprus	2.8	Portugal	2.2
Germany	12.4	Latvia	4.7	Romania	1.5
Estonia	13.5	Lithuania	4.3	Slovenia	10.0
Ireland	1.6	Luxembourg	10.8	Slovakia	4.9
Greece	3.3 (p)	Hungary	7.0	Finland	5.9
Spain	9.0	Malta	8.3	Sweden	6.6
United Kingdom	16.0	EU - 28 countries	12.2		

(p) - provisional

Source: https://ec.europa.eu/eurostat/databrowser/view/CEI_SRM030/default/table?lang=en&category=cei.cei_srm

A larger value for the circular use rate means that more secondary materials replace primary raw materials, therefore reducing the impact upon the environment of primary material extraction. For Romania the situation is even worse when compared to the previous indicator, this time it being situated right at the bottom with a value of 1.5% (Table 3, Figure 3). However, as can be observed, no less than ten member states see a rate equal to or below 5%, while eleven others are placed below the European average. This average is positively influenced by the larger values of seven countries, but especially by the rate of 28.9% of the Netherlands, which is 2.36 times larger than that of EU-28 and 19.26 times larger than that of Romania.

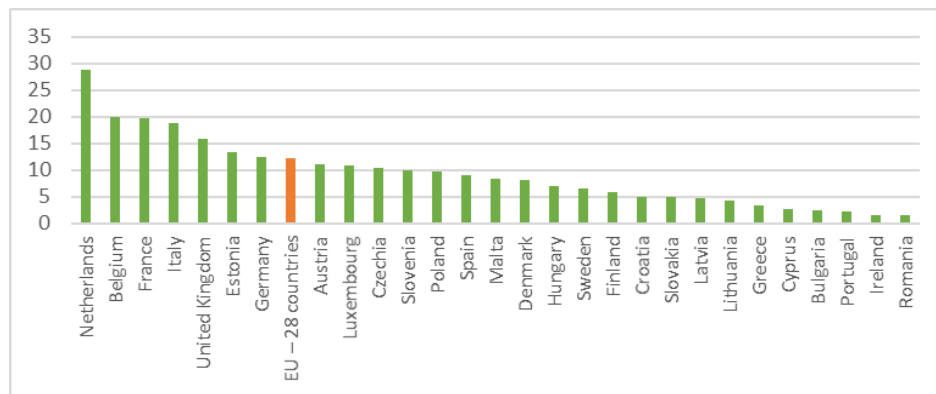


Figure 3. Circular material use rate at the level of EU member states in 2018

- The Gross investment in tangible goods is defined as investment in the reference year in all tangible goods in the following two sectors: the recycling sector and the repairs and reuse sector. From the very beginning it can be seen (Table 4., Figure 4.) that 9 out of the 28 member states do not report the value of these investments or it is confidential. With all that said, the value estimated by Eurostat of gross investment in tangible goods for EU-28 is large, reaching 19600 million euros.

Table 4. Gross investment in tangible goods at the level of EU member states in 2018

GEO	Indicator (million euro)	GEO	Indicator (million euro)	GEO	Indicator (million euro)
Belgium	744.6	France	: (c)	Netherlands	1132.7
Bulgaria	117.3	Croatia	97.4	Austria	392.6
Czechia	:	Italy	1944.9	Poland	707.4
Denmark	282.3	Cyprus	26.3	Portugal	256.3
Germany	3845.9	Latvia	48.5	Romania	359.8
Estonia	:	Lithuania	69.1	Slovenia	: (c)
Ireland	: (c)	Luxembourg	: (c)	Slovakia	220.3
Greece	39.4	Hungary	242.2	Finland	: (c)
Spain	1224.2	Malta	:	Sweden	572.8
United Kingdom	: (c)	EU – 28 countries (s)	19600		

(:) - not available; (c) - confidential

Source: https://ec.europa.eu/eurostat/databrowser/view/CEI_CIE010/default/table?lang=en&category=cei.cei_cie

Romania, with 359,8 million euro investments in the recycling and repairs and reuse sectors surpasses countries such as Greece, Bulgaria, Denmark, Hungary, Portugal etc., ranking eighth in the hierarchy of member states that have reported this indicator. It is, however, far behind Germany, whose investment value is 10.68 times larger.

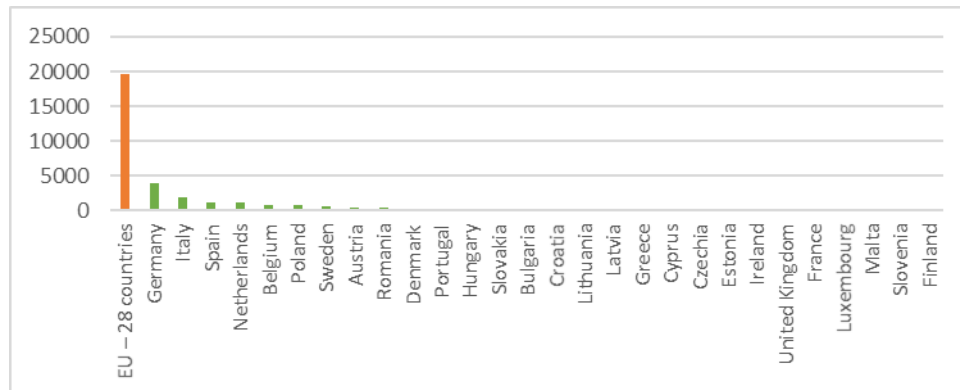


Figure 4. Gross investment in tangible goods at the level of EU member states in 2018

4. CONCLUSIONS

The European Union is determined to create and implement as soon as possible models of a circular economy that are more efficient for all 3 structural levels of economic activities (micro, mezzo, and macro). For this strategies, plans, regulations and directives have been elaborated, which would help member states achieve their own transition towards a circular economy.

In order to monitor registered progress, the European Commission has created a monitoring framework which currently contains ten indicators calculated by Eurostat and available in this database. From the analysis made while taking into account four of the indicators, for the most recent year with available data, namely 2018, it can be determined that Romania, unlike the other member states still has a fairly long road ahead, especially with regards to the waste recycling rate and the use of secondary raw materials in the production process. It is, however, to be appreciated the not very low level of gross tangible goods investment in the recycling and repairs and reuse sectors compared with the other countries, even though the lack of data for a fair few number of member states prohibits us from forming a clear picture.

The only indicator which places Romania in the top of the ranking, generation of waste excluding major mineral wastes per domestic material consumption, leads us to say that, although for some areas of interest of the circular economy urgent measures are being imposed at the level of all involved (public administration/political decision-makers, companies, but also the entire populace), for others, however, important steps have been taken towards a truly durable development.

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